

TEACHERS' RETIREMENT BOARD
INVESTMENT COMMITTEE

SUBJECT: Report on Risk Measurement and Control

ITEM NUMBER: 11

ATTACHMENT(S): 1

ACTION: _____

DATE OF MEETING: March 8, 2000

INFORMATION: X

PRESENTER(S): Mr. Mitchell

EXECUTIVE SUMMARY

Gerald Corrigan, former president of the New York Federal Reserve Bank, described risk management as getting the right information to the right people at the right time. The "right information" refers to having enough, but not too much, data. The "right people" refers providing the information the appropriate committees, groups, or individuals responsible for an activity. The "right time" is a constant trade-off between speed and accuracy.

Risk measurement and control practices range from overtly simple to numbingly complex. Somewhere in between is the appropriate approach to risk measurement and control for CalSTRS. The "best" approach should identify and concentrate key risks in a concise and understandable manner.

One of the 1999/00 Objectives for the Investment Branch was to "Explore, evaluate, and present a report regarding traditional and non-traditional risk measurement and control alternatives". During the review and preparation for this agenda item four components have been isolated and identified as critical in establishing a risk measurement and control program: (1) Culture, (2) Universe, (3) Process, and (4) Control.

CULTURE

The essence of culture is organizational acceptance of risk measurement and control principles combined with a tradition of risk awareness. Culture begins with sound hiring practices using predetermined experience and education hurdles. This is followed by risk/reward policies to incentivize desired behaviors. The final piece to the puzzle is recognizing that risk measurement and control is a combination of art and science.

UNIVERSE

Each financial institution operates within a universe differentiated by operating requirements, business purposes, and investment objectives. As a public pension plan the operating universe is conformed by:

1. Long-term investor, not a short-term trader, committed to strategic allocations and able to ride-out financial market fluctuations.
2. Limited short or leveraged positions which might be subject to extreme volatility.
3. Discipline of developing long-term asset allocation which typically is diversified across asset categories and management styles.

PROCESS

The next component is designing a process that includes appropriate responsibilities, limits, and policies. It is important to agree on the definition of risk and assignment of the appropriate risk measures. Is risk absolute or relative? Are tracking error or standard deviation measures too simplistic? Should risk be measured daily, quarterly, annually, or longer-term (5 to 10 years)?

CONTROL

The emphasis of the control segment should be to attempt to influence events that can significantly affect the investment portfolio. It is infeasible to attempt to prevent every possible situation where something could go wrong in the investment process. There are standard practices, which address typical or routine investment situations. Specialized risk controls are used for complex investment strategies. Risk controls work best when culture, universe, and process are considered and incorporated.

CONCLUSION

Several risk control practices, designed to mitigate a majority of the significant investment risks contained in the portfolio, are considered as best practices. These practices are as follows: (1) delivery versus payment (DVP) settlement for publicly traded securities, (2) multiple authorizations (dual control) for all transactions, (3) policies and procedures for each investment activity, and (4) external contractors for audit, consulting, and custody. CalSTRS has incorporated these practices into the investment policies to help control the risk inherent in a global investment portfolio.

RISK MEASUREMENT AND CONTROL

Risk measurement and control ranges from overtly simple to numbingly complex. Somewhere in between is the appropriate approach to risk measurement and control for CalSTRS. Whichever approach is selected should identify and present key risks in an understandable manner.

RISK MEASUREMENT AND CONTROL

In preparation of this document a variety of written material was reviewed including information from Wall Street Investment banks, investment management firms, general consulting documents, peer group programs, and NASIO Pension Fund Risk Guidelines and Principles. With permission, a number of the concepts contained in those documents have been incorporated in this agenda item. In the simplest form, there are four basic components comprising a risk measurement and control program.

1. Culture
2. Universe
3. Process
4. Control

CULTURE

The essence of culture is organizational acceptance of risk measurement and control principles combined with a tradition of risk awareness. Culture begins with sound hiring practices using predetermined experience and education hurdles. This is followed by risk/reward policies to incentivize desired behaviors. The final piece to the puzzle is recognizing that risk measurement and control is a combination of art and science.

The crafting of a risk measurement and control program defines the organizational attitudes towards the perpetual risk/return trade-off. Most pension plans have been engaging in some form of risk measurement and control for many years, yet have not had an explicit policy or program in place.

UNIVERSE

Each financial institution operates within a universe differentiated by operating requirements, business purposes, and investment objectives. As a public pension plan the operating universe is confirmed by:

1. Long-term investor, not a short-term trader, committed to strategic allocations and able to ride-out financial market fluctuations.
2. Limited short or leveraged positions which may be subject to extreme volatility.
3. Discipline of developing long-term asset allocation which typically is diversified across asset categories and measurement and control styles.

The heart of a risk measurement and control system is the identification of particular risks to the operation or organization. Risk measurement and control practices stress the importance of self-analyzing the nature of the respective risks, prioritizing based on individualized assessment. In the public pension plan community, the key risks are constant and common to all:

1. Are there sufficient funds available to pay the promised benefits?
2. Have the investment goals remained unchanged?
3. Are there sudden and material changes to the investment plan?

One of the most serious threats to the stability of the solvency of the investment program is the unexpected impact of legislative actions. Radical change could be imposed by political bodies, which might be judged, over time, as inappropriate. It is imperative that communication and educational efforts be undertaken by pension funds with respect to plan participants and governing authorities.

PROCESS

Designing a process that includes appropriate responsibilities, limits, and policies is mandatory. It is important that the Teachers' Retirement Board and staff agree on the definition of risk and assignment of the appropriate risk measures. Is risk absolute or relative? Are tracking error or standard deviation measures too simplistic? Should risk be measured daily, quarterly, annually, or longer-term (5 to 10 years)?

CONTROL

The emphasis should be to attempt to control events that can significantly affect the investment portfolio. It is infeasible to attempt to prevent every possible situation where something could go wrong in the investment process. There are standard practices, which address typical or routine investment practices. Specialized risk controls may be

needed for some advanced investment strategies. Risk controls work best when culture, universe, and process are considered and incorporated.

Two objectives for a risk measurement and control program are to gain an enhanced benefit from taking investment risks and to minimize non-compliance with established policies and procedures. There are four elements of control listed below:

1. Risk controls should recognize the difference between fund size and complexity. It goes without saying, public pension plans have varying degrees of complexity. In general, the larger and more complex the organization and investment activities, the greater need for extensive and detailed procedures and reviews. A large fund with indexed public equity and fixed income investments may choose a less elaborate monitoring and reporting system than a smaller fund with dozens of strategies and numerous investment managers.
2. Risk controls should be regular and allow for easy implementation. The organization should rely on a monitoring and reporting system, which operates in an expected and regular manner. It should exclude ad hoc judgements of individuals as the primary determinate of implementation. The monitoring and reporting system should be well documented to avoid surprises or inconsistent results associated with personnel changes.
3. Risk controls should be based on independent and redundant checks of major activities. People and systems will occasionally fail, as a result, the Teachers' Retirement Board requires some independent verification that the desired policies and procedures are being implemented. This independent verification is primarily the responsibility of the general consultant with assistance from the external and internal auditors.
4. Risk controls should have a mechanism to address any deficiency that is identified. Once the risk controls are implemented and the key risks are monitored, specific corrections should be identified for any deficiency noted. This mechanism should make distinctions based on the relative exposure to CalSTRS.

IMPLEMENTATION AT CALSTRS

The scope of the implementation review for this agenda item concentrates on the purchase, sale, custody, management, and recordkeeping of the California State Teachers' Retirement System's (CalSTRS) assets. The risk measurement and control activity focuses on the identification of potential risks, development of mitigation strategies, and monitoring adherence to established policies and procedures.

With the advances in automation and increasing complexity of the assets under management over the past ten years, CalSTRS has reconfigured its processes to focus on separation of duties, multiple authorizations, automated processing, and electronic

reporting. This has been accomplished by a combination of developing policies and procedures, coupled with monitoring compliance by internal and external audits and reviews.

Mitigation of the risks associated with the transfer of funds when a security is purchased or sold is one of the highest priorities. The practice of utilizing the delivery versus payment ("DVP") settlement, for publicly traded fixed income and equity securities, substantially reduces the risk to CalSTRS. There are circumstances which require the payment of funds without receiving delivery of an asset. These transactions are handled on an exception basis with an emphasis on accurate and timely monitoring of each transaction including multiple authorizations by the investment manager, custodian, and investment operations. The diverse nature of the various assets held in the investment portfolio inherently cause custody risk associated with the safekeeping of CalSTRS's assets. This risk has been compounded with the purchase of private equity and non-dollar denominated securities.

From inception to 1987, California law required CalSTRS to utilize the California State Treasurer's office as the custodian for investment assets. After the law was modified, CalSTRS began implementing its Investment Management Plan which included modification of the control process.

The first step was the creation of the investment operations area. The investment operations area is responsible for the coordination of activities between the investment managers, State Treasurer's Office, State Controller's Office, CalSTRS's Accounting Department, and master custodian. The investment operations area provides assurance that adequate safeguards are in place to handle the diverse array of securities contained in the investment portfolio. The investment operations area reviews the investment manager's monthly reports to ensure that the manager has performed the required account reconciliation to the custodian.

Another step was the development of policies and procedures for each of the major asset categories and soft-dollar, off-balance sheet, and corporate governance programs. Policies established boundaries identifying acceptable behaviors and desired guidelines. Procedures dynamically allow appropriate actions, which are consistent with the policies, to be taken in response to changes in the marketplace.

CalSTRS emphasizes separation of duties as one of the primary methods of reducing risk. The investment managers are responsible for selecting the securities to be purchased or sold. Investment operations reports authorized trades to the master custodian where the trades are reviewed and then processed. CalSTRS' investment operations area is responsible for identifying the cash flow requirements and assuring the appropriate quantity of funds are available for settlement. The master custodian is responsible for the settlement, income collection, and safekeeping of the investment securities. CalSTRS accounting staff, working in conjunction with investment operations, is responsible for the internal accounting and control of all investment cash flows. State Controller's Office reviews the claim schedule for securities purchases and ensures that funds are available

for transfer to the custodian. The State Controller's Office then authorizes the State Treasurer's Office to transfer the appropriate funds to the custodian. The pension consultant is responsible for verifying the reasonableness of the performance as measured and reported by the custodian.

Internal staff and external entities routinely complete reviews and audits. Security and cash movements are controlled and reviewed at multiple levels. Authorized security transactions are matched or "paired up" prior to settlement dates. The master custodian, investment operations, investment manager, and State Controller's Office review cash and security movement reports. A list of the major reviews are identified below:

Performed by CalSTRS:

1. Adoption of policies and procedures
2. Internal review of custodian contract and service level agreement
3. Internal audits including a periodical review of policy and procedures
4. External financial audit at fiscal year end of investment assets

Performed by Master Custodian:

1. Internal audits including a periodical review of custody service
2. External financial audit at fiscal year end for CalSTRS' investment assets
3. External audit and review of internal controls and custody service
4. Federal Reserve Bank audit including custody controls and procedures

Performed by the General Consultant:

1. Periodic review of the custodian services.
2. Review of the performance numbers.

In addition to the reviews and audits listed, the State Controller's Office performs a daily post audit review of purchases and periodic audits on the custodian and cash management systems. External fiscal year end audits are sent to the Auditor General and the State Controller's Office.

CONCLUSION

Several risk control practices, designed to mitigate a majority of the significant risks contained in the portfolio are considered best practices. These practices are as follows: (1) delivery versus payment (DVP) settlement for publicly traded securities, (2) multiple authorizations (dual control) for all transactions, (3) policies and procedures for each investment activity, and (4) external contractors for audit, consulting, and custody. CalSTRS has incorporated these practices into the investment policies to assist the Teachers' retirement Board in controlling the risk inherent in managing a global investment portfolio.